PRESENTATION OF CLAIMS

All pending claims are set forth as follows. No claim is amended.

1. (Previously Presented) A method for refining a node of a decision tree associated with a plurality of data characterized by a plurality of features, comprising:

selecting a feature from among the features characterizing the data associated with the node;

performing a cluster analysis along the selected feature to group the data into one or more clusters based on distances between the data and respective one or more centers of the one or more clusters;

constructing one or more arcs of the decision tree at the node respectively for each of the one or more clusters;

projecting the data in each of the clusters, wherein the projected data are characterized by the plurality of the features but for the selected feature; and

recursively performing the steps of selecting a feature and performing the cluster analysis on the projected data in each of the clusters.

2. (Original) The method according to claim 1, wherein the step of selecting the feature includes the steps of:

performing a plurality of cluster analyses along each of the features to calculate a maximal cluster validity measure, said maximal cluster validity measure corresponding to one of the features; and

selecting the one of the features that corresponds to the maximal cluster validity measure.

3. (Original) The method according to claim 2, wherein the step of performing a plurality of cluster analyses along each of the features to calculate a maximal cluster validity measure includes the performing the steps of:

for each of the features, performing a plurality of cluster analyses along said each of the

features for a plurality of cluster numbers to calculate respective partition coefficients;

and

determining the maximal cluster validity measure from among the partition coefficients.

4. (Original) The method according to claim 1, wherein the step of performing the cluster analysis includes the step of performing a fuzzy cluster analysis.

5. (Original) The method according to claim 4, wherein the step of performing the fuzzy cluster analysis includes the step of performing a fuzzy c-means analysis.

6. (Original) The method according to claim 1, wherein the step of performing the cluster analysis includes the step of performing a hard cluster analysis.

7. (Previously Presented) A method for refining a node of a decision tree associated with a plurality of data characterized by a plurality of features, comprising:

selecting a feature from among the features characterizing the data associated with the node;

performing a cluster analysis along the selected feature to group the data into one or more

clusters;

constructing one or more arcs of the decision tree at the node respectively for each of the one

or more clusters;

projecting the data in each of the clusters, wherein the projected data are characterized by the

plurality of the features but for the selected feature; and

recursively performing the steps of selecting a feature and performing the cluster analysis on

the projected data in each of the clusters,

wherein the step of performing the cluster analysis along the selected feature to group the

data into one or more clusters includes the steps of:

calculating a domain ratio of a difference in domains limits of the data over a difference

in domain limits of a superset of the data;

determining whether the domain ratio has a predetermined relationship with a

predetermined threshold; and

if the domain ratio has the predetermined relationship with the predetermined threshold,

then grouping the data into a single cluster.

8. (Original) The method according to claim 7, wherein the step of determining whether the

domain ratio has the predetermined relationship with the predetermined threshold includes the

step of determining whether the domain ratio is less than the predetermined threshold.

9. (Canceled)

10. (Previously Presented) A method for generating a decision tree for a plurality of data

characterized by a plurality of features, comprising:

performing a plurality of cluster analyses along each of the features to calculate a plurality of

respective partition coefficients based on membership functions of the data for one or

more clusters in respective said cluster analyses;

selecting the one of the features corresponding to a maximal partition coefficient from among

the partition coefficients;

subdividing the data into one or more groups based on the selected feature; and

building the decision tree based on the one or more groups.

11. (Canceled)

12. (Original) The method according to claim 10, wherein the step of performing the cluster

analyses includes the step of performing a plurality of fuzzy cluster analyses.

13. (Original) The method according to claim 10, wherein the step of performing the fuzzy

cluster analyses includes the step of performing a plurality of fuzzy c-means analyses.

14. (Original) The method according to claim 10, wherein the step of performing the cluster

analyses includes the step of performing a plurality of hard cluster analyses.

15. (Original) The method according to claim 10, wherein the step of performing the cluster

analyses includes the steps of:

calculating a domain ratio of a difference in domains limits of the data over a difference in

domain limits of a superset of the data;

determining whether the domain ratio has a predetermined relationship with a predetermined

threshold; and

if the domain ratio has the predetermined relationship with the predetermined threshold, then

grouping the data into a single cluster.

16. (Original) The method according to claim 10, wherein building the decision tree based on the one or more groups includes the steps of:

projecting the data in each of the groups, wherein the projected data are characterized by the plurality of the features but for the selected feature; and

recursively performing the steps of selecting a feature, comprising selecting a new one of the features corresponding to a new maximal partition coefficient and subdividing the data into one or more new groups based on the selected new feature.

17. (Original) A method for generating a decision tree for a plurality of data characterized by a plurality of features, comprising:

performing a plurality of fuzzy cluster analyses along each of the features to calculate a maximal partition coefficient and a corresponding set of one or more fuzzy clusters, said maximal partition coefficient corresponding to one of the features;

selecting the one of the features corresponding to the maximal partition coefficient; and

building the decision tree based on the corresponding set of one or more fuzzy clusters.

18. (Previously Presented) A computer-readable medium bearing instructions for refining a node of a decision tree associated with a plurality of data characterized by a plurality of features, said instructions being arranged to cause one or more processors upon execution thereby to perform the steps of:

selecting a feature from among the features characterizing the data associated with the node;

performing a cluster analysis along the selected feature to group the data into one or more clusters based on distances between the data and respective one or more centers of the one or more clusters;

constructing one or more arcs of the decision tree at the node respectively for each of the one

or more clusters;

projecting the data in each of the clusters, wherein the projected data are characterized by the

plurality of the features but for the selected feature; and

recursively performing the steps of selecting a feature and performing the cluster analysis on

the projected data in each of the clusters.

19. (Original) The computer-readable medium according to claim 18, wherein the step of

selecting the feature includes the steps of:

performing a plurality of cluster analyses along each of the features to calculate a maximal

cluster validity measure, said maximal cluster validity measure corresponding to one of

the features; and

selecting the one of the features that corresponds to the maximal cluster validity measure.

20. (Original) The computer-readable medium according to claim 19, wherein the step of

performing a plurality of cluster analyses along each of the features to calculate a maximal

cluster validity measure includes the performing the steps of:

for each of the features, performing a plurality of cluster analyses along said each of the

features for a plurality of cluster numbers to calculate respective partition coefficients;

and

determining the maximal cluster validity measure from among the partition coefficients.

21. (Original) The computer-readable medium according to claim 18, wherein the step of

performing the cluster analysis includes the step of performing a fuzzy cluster analysis.

22. (Original) The computer-readable medium according to claim 21, wherein the step of performing the fuzzy cluster analysis includes the step of performing a fuzzy c-means analysis.

23. (Original) The computer-readable medium according to claim 18, wherein the step of performing the cluster analysis includes the step of performing a hard cluster analysis.

24. (Previously Presented) A computer-readable bearing instructions for refining a node of a decision tree associated with a plurality of data characterized by a plurality of features, said instructions being arranged to cause one or more processors upon execution thereby to perform the steps of:

selecting a feature from among the features characterizing the data associated with the node;

performing a cluster analysis along the selected feature to group the data into one or more clusters;

constructing one or more arcs of the decision tree at the node respectively for each of the one or more clusters;

projecting the data in each of the clusters, wherein the projected data are characterized by the plurality of the features but for the selected feature; and

recursively performing the steps of selecting a feature and performing the cluster analysis on the projected data in each of the clusters,

wherein the step of performing the cluster analysis along the selected feature to group the data into one or more clusters includes the steps of:

calculating a domain ratio of a difference in domains limits of the data over a difference in domain limits of a superset of the data;

determining whether the domain ratio has a predetermined relationship with a

predetermined threshold; and

if the domain ratio has the predetermined relationship with the predetermined threshold,

then grouping the data into a single cluster.

25. (Original) The computer-readable medium according to claim 24, wherein the step of

determining whether the domain ratio has the predetermined relationship with the predetermined

threshold includes the step of determining whether the domain ratio is less than the

predetermined threshold.

26. (Canceled)

27. (Previously Presented) A computer-readable medium bearing instructions for generating

a decision tree for a plurality of data characterized by a plurality of features, said instructions

being arranged to cause one or more processors upon execution thereby to perform the steps of:

performing a plurality of cluster analyses along each of the features to calculate a plurality of

respective partition coefficients based on membership functions of the data for one or

more clusters in respective said cluster analyses;

selecting the one of the features corresponding to a maximal partition coefficient from among

the partition coefficients;

subdividing the data into one or more groups based on the selected feature; and

building the decision tree based on the one or more groups.

28. (Canceled)

29. (Original) The computer-readable medium according to claim 27, wherein the step of performing the cluster analyses includes the step of performing a plurality of fuzzy cluster analyses.

30. (Original) The computer-readable medium according to claim 27, wherein the step of performing the fuzzy cluster analyses includes the step of performing a plurality of fuzzy c-means analyses.

31. (Original) The computer-readable medium according to claim 27, wherein the step of performing the cluster analyses includes the step of performing a plurality of hard cluster analyses.

32. (Original) The computer-readable medium according to claim 27, wherein the step of performing the cluster analyses includes the steps of:

calculating a domain ratio of a difference in domains limits of the data over a difference in domain limits of a superset of the data;

determining whether the domain ratio has a predetermined relationship with a predetermined threshold; and

if the domain ratio has the predetermined relationship with the predetermined threshold, then grouping the data into a single cluster.

33. (Original) The computer-readable medium according to claim 27, wherein building the decision tree based on the one or more groups includes the steps of:

projecting the data in each of the groups, wherein the projected data are characterized by the

plurality of the features but for the selected feature; and

recursively performing the steps of selecting a feature, comprising selecting a new one of the

features corresponding to a new maximal partition coefficient and subdividing the data

into one or more new groups based on the selected new feature.

34. (Original) A computer-readable medium bearing instructions for generating a decision

tree for a plurality of data characterized by a plurality of features, said instructions being arranged

to cause one or more processors upon execution thereby to perform the steps of:

performing a plurality of fuzzy cluster analyses along each of the features to calculate a

maximal partition coefficient and a corresponding set of one or more fuzzy clusters, said

maximal partition coefficient corresponding to one of the features;

selecting the one of the features corresponding to the maximal partition coefficient; and

building the decision tree based on the corresponding set of one or more fuzzy clusters.

35. (Previously Presented) The method of claim 17 wherein the maximal partition coefficient

is based on membership functions of the data for the set of one or more clusters.

36. (Previously Presented)   The computer-readable medium of claim 34, wherein the

maximal partition coefficient is based on membership functions of the data for the set of one or

more clusters,